

A Systematic Review of the Impact of Healthcare Reforms on Access to Emergency Department and Elective Surgery Services: 1994–2014

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Sandeep Reddy¹, Peter Jones²,
Harsha Shanthanna³, Raechel Damarell⁴,
and John Wakerman⁵

Abstract

This systematic review sought to identify whether health care reforms led to improvement in the emergency department (ED) length of stay (LOS) and elective surgery (ES) access in Australia, Canada, New Zealand, and the United Kingdom. The review was registered in the PROSPERO database (CRD42015016343), and nine databases were searched for peer-reviewed, English-language reports published between 1994 and 2014. We also searched relevant “grey” literature and websites. Included studies were checked for cited and citing papers. Primary studies corresponding to national and provincial ED and ES reforms in the four countries were considered. Only studies from Australia and the United Kingdom were eventually included, as no studies from the other two countries met the inclusion criteria. The reviewers involved in the study extracted the data independently using

¹Deakin University Faculty of Health, Waurn Ponds Campus, Geelong, Victoria, Australia

²Auckland City Hospital, Auckland, New Zealand

³McMaster University, St Joseph’s Hospital, Hamilton, Ontario, Canada

⁴College of Medicine and Public Health, Flinders University, Adelaide, South Australia, Australia

⁵Flinders University, School of Medicine, Adelaide, South Australia, Australia

Corresponding Author:

Sandeep Reddy, School of Medicine, Waurn Ponds Campus, Deakin University, Geelong, VIC 3220, Australia.

Email: sandeep.reddy@deakin.edu.au

standardized forms. Studies were assessed for quality, and a narrative synthesis approach was taken to analyze the extracted data. The introduction of health care reforms in the form of time-based ED and ES targets led to improvement in ED LOS and ES access. However, the introduction of targets resulted in unintended consequences, such as increased pressure on clinicians and, in certain instances, manipulation of performance data.

Keywords

systematic review, healthcare reforms, emergency department access, elective surgery access

Introduction

Access to health care has been defined as the ability to use personal health services in a timely manner so as to achieve optimal health outcomes.^{1,2} An essential objective of many health care reforms is to enable equity in access to health care services.¹⁻⁴ Government efforts to reform hospital access receive prominent attention from both the government and public, despite the government's intentions to focus reforms across all levels and components of health care services.^{2,4-7} This is because delay in access to hospital services leads to unwanted media attention and public outcry, and also exacerbates health inequities.^{5,8} Therefore, improving access to hospital services is a common component in many government led health care reforms.^{1-3,5,6,9-11}

Health care reforms to improve access do not necessarily involve restructuring the health system but can be introduced in the form of targets or performance measures.^{3,6,9,12,13} A central authority can set targets or performance standards and consequently expect certain levels of performance from health care providers.⁹

Currently, sparse evidence exists to show that health care access can be improved through targets and performance reporting, but there is an opinion that targets lead to improvement in access over time.⁹ Few, if any, systematic reviews assess the impact of reforms on hospital access and also assess reforms across multiple countries. To summarize the evidence base about the impact of health care reforms on access to hospital services, this systematic review examined health care reforms (both at national and provincial level) in four countries: Australia, Canada, New Zealand, and the United Kingdom over the 1994–2004 period. The four countries were chosen because of the commonalities of their health care systems. They are also all English-speaking OECD member countries, with universal insurance coverage and provision of health care largely through a public health care system financed through tax.¹³ To make the

review manageable, access to two components of hospital services, emergency department (ED) and elective surgery (ES), were selected. In recent health care reforms, targets have been a dominant component within the four countries selected for this review.^{3,6,9,12,13,15–18}

Summary of ED and ES Reforms in the Target Countries

Reforms in the United Kingdom have occurred incrementally since the 1980s,¹⁸ but it is only in the latest set of reforms, commencing at the end of the 1990s, that targets and performance measurement became a prominent feature.^{8,18} A key target introduced in 2000 was the reduction to 4 h of the benchmark time a patient could spend in an ED for completion of treatment.^{20,21,22} Also during this period, a “star rating” system for hospitals was introduced to allow for comparative performance assessment.^{22,23} Waiting time targets for ES were included in the performance assessment.

Recent hospital reforms in Australia and New Zealand have been influenced by the hospital reforms in the United Kingdom, especially the introduction of ED targets.^{14,20,23} Over decades, Australian EDs have seen increasing demand and worsening access.^{24,25} Western Australia, inspired by the U.K. 4-h rule, introduced a similar program in its hospitals in 2009.²⁶ The Western Australia experience, in turn, influenced the Australian government’s introduction in 2011 of the National Emergency Access Target (NEAT) for all public hospitals with EDs.²⁸ The NEAT measure, like the U.K. 4-h standard, imposed a 4-h cut-off for ED length of stay while allowing for clinical exceptions.^{27,28} New Zealand also introduced an ED target in 2009 inspired by the U.K. experience. However, the target allowed for a 6-h cut-off as opposed to a 4-h cut-off.¹⁴

In addition to the ED targets, the Australian and New Zealand governments introduced elective surgery targets to reduce the number of patients waiting beyond clinically recommended times.^{4,15,28} In Canada, waiting times have also been used to monitor and improve access to ES.^{5,12,29} Responsibility for driving improvement to ES access has been vested in the provinces. To enable comparison across provinces, pan-Canadian benchmarks were established.⁵ Regular reporting of waiting times for these priority areas and other hospital services is undertaken by federal, provincial, and independent groups.⁵

Waiting times for surgery reflect access to care directly. ED LOS reflects both the efficiency of care for patients discharged from the ED and the access to hospital for those patients admitted acutely. We define improvement in access by reduced waiting times and length of stay. Therefore, the objectives of this systematic review were to understand (1) whether the introduction of targets led to improvements in ED and ES access, as measured by ES waiting times and ED LOS, and (2) whether the introduction of targets led to unintended consequences.

Methods

Our review protocol was registered in PROSPERO with the registration number CRD42015016343. Our selection criteria are listed in Table 1, and search strategy is summarized in the Appendix.

The search for relevant articles commenced with an initial scoping review of Medline (Ovid platform) to test search terms and identify additional relevant ones. A full search strategy was developed for this database and accurately translated for PubMed (non-indexed content only), CINAHL, Scopus, Web of Science Core Collection, Current Contents Connect, Informit (all subsets), and ProQuest (all included databases). Database searches combined database-specific subject headings (where available) and a wide range of text word synonyms to maximize search sensitivity. Searches were restricted to English language and the date range 1994–2014, in accordance with the review question parameters. The Medline search strategy is described in the Appendix. All other search strategies are available upon request from the corresponding author.

In addition to the aforementioned databases, we searched for reports and theses focusing on our four countries of interest using Australian Policy Online, TROVE (National Library of Australia), Theses Canada (National Library of Canada), EThOS (British Library), and nzresearch.org.nz (National Library of New Zealand). We also searched the websites of relevant

Table 1. Inclusion and exclusion standards according to specific criteria.

Criteria	Inclusion	Exclusion
Study type	Peer-reviewed primary research	Non-peer-reviewed and/or secondary research
Time period	1994–2014	Other time periods
Language	English	Other languages
Geographical delimitation	Australia and/or Canada and/or New Zealand and/or the U.K.	All other countries
Aspect of reform	National-level and/or provincial-level health care reforms	All other levels of reform like institutional or localized health care reforms
Aspect of health service	Public hospitals and/or public-private partnerships	Private hospitals
Aspect of performance measure	Hospital access: emergency department and elective surgery time-based performance measures	Other hospital performance measures
Methods	Qualitative and/or quantitative and/or mixed-methods	No explicit method described

national government health departments (Departments of Health for Australia and the United Kingdom, Council of Australian Governments (COAG), New Zealand Ministry of Health, Health Canada, and National Health Service). We also checked the websites of organizational stakeholders in emergency department and elective surgery service provision for relevant information. These included the Australian Institute of Health and Welfare (AIHW), National Emergency Department Collaborative, Royal Australasian College of Surgeons, Australian Medical Association (AMA), Australian Health Services Research Institute (AHSRI), Australian Healthcare and Hospitals Association, Emergency Care Institute (ECI), Health Improvement and Innovation Resource Centre in New Zealand, Canadian Healthcare Association (CHA), Canadian Institute for Health Information (CIHI), and The King's Fund in the United Kingdom).

Study selection was carried in two stages. The first stage involved title and abstract screening. Two reviewers independently screened relevant full-text articles during the second stage and resolved discrepancies through discussion. Paired reviewers, using standardized extraction forms, carried out data extraction. The extracted items included study characteristics, objectives, reforms introduced, and results or performance measures. The studies were appraised for quality using either a Newcastle-Ottawa scale (for quantitative studies) or a McMaster critical tool (for qualitative studies). Since we expected considerable heterogeneity between the study populations, reforms, and outcome measures, we decided a priori not to conduct a formal meta-analysis. We evaluated study outcomes qualitatively and reported our study characteristics, reforms, and results in tables. We summarized each of our study outcomes individually. Further, we carried out thematic analysis of the extracted data through NVivo for Mac with free line-by-line coding of the data. This was followed by organizing coded data into related themes. The emergent analytical themes were then cross-checked with individual studies to ensure alignment with their findings. Following this, we organized the themes to relate to the review objectives.

Results

Database searches identified 834 citations. The combined searches of grey sources, Google, and Google Scholar retrieved a further 756 resources for consideration. After removing duplicates, 1,170 unique citations were screened by title and abstract against the eligibility criteria. Of these, 1,129 citations were eliminated, and the full text was sought for the remaining 41 citations. Based on a full-text reading, a further 20 studies were excluded and the reasons for exclusion documented. The remaining 21 studies were then included in the narrative synthesis. This process is described graphically in a PRISMA flow diagram (Figure 1).

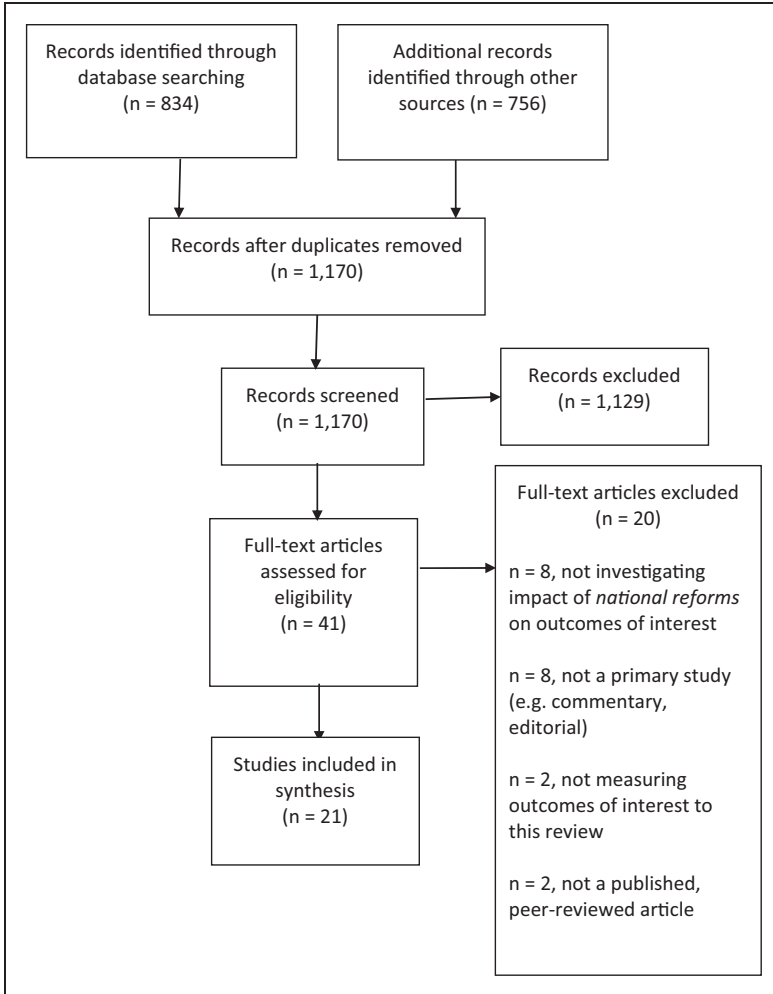


Figure 1. PRISMA flow diagram.

Of the 21 studies included in the qualitative synthesis, 10 studies exclusively related to ED access, 7 studies covered ES access only, and the remaining studies either covered both ED and ES access or included other hospital performance measures. Of the 21 studies, 5 studies covered health care reform in Australia and the remaining 16 studies covered health care reform in the United Kingdom. Although we planned to identify the effect of reforms on ED and ES services in Canada and New Zealand, our review was unable to identify studies that covered this, because no Canadian or New Zealand studies met the inclusion

criteria. The outcomes of the national or provincial health care reforms in Australia and United Kingdom identified through the included studies are summarized in Table 2.

Quality of Included Studies

For qualitative studies included in the review, two coauthors in parallel reviewed the studies using the McMaster critical review form.³⁰ The assessment includes review of study purpose, literature, study design, sampling, data collection and analysis, overall rigor, and conclusion. Four of the 21 studies were assessed using this approach. Since this assessment did not involve scoring, a score cannot be provided for these studies, but the assessed studies fulfilled most of the critical review criteria.

For the quantitative or mixed-method studies (17 of the 21 included studies), a single coauthor did the assessment of the quality using the Newcastle Ottawa Scale (NOS). The NOS assesses cohort or case control studies for selection, comparability, and exposure parameters, with a maximum of one star awarded for each item within the selection and outcome categories and a maximum of two stars for the comparability categories.³¹ The NOS assessment results are outlined in Table 2 as well.

Improvement in ED Access

Most of the included ED studies identified reduction in ED waiting times and length of stay (LOS) following introduction of health care reforms.^{32–40} All the ED reforms covered in this review were introduced in the form of targets set for specific performance measures. In the United Kingdom, it was the 4-h target for ED LOS.^{34–36} In Australia, programs and targets inspired by the U.K. 4-h target were introduced.^{26, 27,32,33} The implementation of these targets clearly led to improvements in ED length of stay in nearly all the hospitals studied.^{32–36} For example, introduction of the 4-h target in hospitals in Western Australia led to an 8% increase in patients discharged or transferred from the ED within 4 h between 2009 and 2011.³² In the United Kingdom, the 4-h target led to a 5% increase in patients discharged or transferred from the ED between 2000 and 2006.³⁴ However, the targets also resulted in pressure on ED clinicians and other parts of the hospitals.^{35–37} Some of the studies discussed opportunities that emerged as a result of introducing reforms and collaboration across the hospital to achieve targets.^{32,33} Examples of resulting opportunities included such innovations as the better use of physical space³⁷ and the establishment of new protocols to see ED patients faster.^{32–34,37} Also, the hospital-wide approach introduced through the 4-h programs enabled faster patient flow by easing blocks for admission of ED patients.^{32–34,37}

Table 2. Summary of all results and quality assessment of quantitative studies.

Country	Type of reform	Publication	Performance measure	Time frames	Study design	Result	Quality of study (Newcastle-Ottawa Scale)		
							Selection (0–4)	Comparability (0–2)	Outcome (0–3)
Australia	Provincial: FHR in WA	Geelhoed and de Klerk, ³²	Mortality rates	2007–2011	Quasi-experimental intervention study using dependent pre-test and post-test samples	Reduction in ED overcrowding from 40% in July 2009 to approximately 10% by early 2011.	3	1	3
			Overcrowding rates			Reduction in mortality rate from 1.12% to 0.98% between 2009–10 and 2010–11 (95% CI, 7%–18%; $P < 0.001$)*			
	Provincial: FHR in WA	van Heerden et al. ³⁸	Compliance with the 4-h rule	2008–2011	Quantitative analysis of pre- and post-intervention hospital data	Monthly compliance with the 4-h rule increased from 35%–46% to 64%–75% in 2011 ($P < 0.001$).	3	1	2
			ICU exit bed block Number of medical emergency team (MET) calls Background hospital activity			Marked increase in ICU bed block-days between 2008 (mean, 4.94 bed block-days/month) and 2011 (mean, 6.98 bed block-days/month) ($P < 0.05$). No significant increase in number of MET calls from 2008 to 2011 ($P = 0.221$). Hospital activity increased from 2008 to 2011 ($P < 0.0001$).			
	Provincial: FHR in WA	Maumil et al. ³³	Percentage of patients admitted, discharged, or transferred from ED within 4 h of arrival at triage	2009–2011	Intervention study using dependent pre-test and post-test samples.	Percentage of patients admitted, discharged, or transferred from ED within 4 h of arrival at triage increased from 87% in 2009 to 95% in 2011.	3	1	2
			Percentage of patients discharged from inpatient wards before 10 a.m.			The percentage of patients discharged from inpatient wards before 10 a.m. increased from 18% in 2009 to 30% in 2011.			

(continued)

Table 2. (continued)

Country	Type of reform	Publication	Performance measure	Time frames	Study design	Result	Quality of study (Newcastle-Ottawa Scale)		
							Selection (0-4)	Comparability (0-2)	Outcome (0-3)
	National: NEAT	Nash et al. ³⁹	Age Co-morbidity Clinical urgency at presentation ED and inpatient length of stay (LOS)	2009-2012	Retrospective cohort study	Increased proportion of younger patients aged ≤50 years (7.7 to 9.1%) admitted to general medicine (GM) GM patients had fewer co-morbid conditions (proportion with Charlson Score ≥ 6 decreased from 14.2% to 11.9%). Increased proportion of urgent Australasian Triage Scale 3 (45.6% to 49.7%) patients and semi-urgent Australasian Triage Scale 4 (21.9% to 27.6%) patients admitted to GM. Median ED LOS was reduced by a little over 1 h (from 8.7 h to 7.3 h, P < 0.001). There was no statistically significant difference in overall inpatient LOS across any of the patient groups.	3	1	3

(continued)

Table 2. (continued)

Country	Type of reform	Publication	Performance measure	Time frames	Study design	Result	Quality of study (Newcastle-Ottawa Scale)		
							Selection (0–4)	Comparability (0–2)	Outcome (0–3)
Australia	National: NEAT	Sullivan et al. ¹⁹	Percentage of patients exiting the ED Mean patient transit times in the ED Inpatient mortality rates ED “did not wait” rates Rates of re-presentations within 48 h of ED discharge	2012–2013	Retrospective pre-post intervention study.	Increase in percentage of patients exiting the ED from 32% to 62%. Reduction in mean patient transit times in the ED from 7.2 ± 5.8 h to 4.4 ± 3.5 h (P < 0.001). Reduced in-hospital mortality from 2.3% to 1.7% (P = 0.045). Reduction in ED “did not wait” rates from 6.9% to 1.9% (P < 0.001) Rise in rates of re-presentations within 48 h of ED discharge slightly from 3.1% to 3.8% (P = 0.023)	3	1	1
UK	National: FHR in England	Freeman et al. ³⁴	Time in ED Time to be seen by ED clinician Admission rates Re-attendance rates	April 2000–February 2006	Interrupted time-series regression analysis of anonymized patient data	Increase in percentage of ED patients seen and treated or transferred within 4 h from 83% to 88%. Reduction in median time to see a clinician from 57 min to 31 min. Reduction in number of patients admitted for less than 24 h and 48 h. Reduction in those re-attending within 7 days.	3	1	2

(continued)

Table 2. (continued)

Country	Type of reform	Publication	Performance measure	Time frames	Study design	Result	Quality of study (Newcastle-Ottawa Scale)		
							Selection (0–4)	Comparability (0–2)	Outcome (0–3)
	National: FHR in England	Mason et al. ³⁵	Proportion of ED patients seen and treated within 4 h ED total length of stay Proportion of patients leaving the ED during the last 20 min before 4 h	2003–2006	Retrospective cohort study	Increase in proportion of ED patients seen and treated within 4 h from 83.9% to 96.3%. Increase in adjusted ED total length of stay by 8.6 min for all patients and 30 min for admissions Increase in proportion of patients leaving the ED during the last 20 min before 4 h from 4.7% to 8.4% of all patients	3	1	3
	National: FHR in England	Weber et al. ³⁶	Changes in ED admission rate Deaths in the ED Return ED visits within 1 week for all patients	2003–2006	Retrospective cohort study	Admissions from ED were unchanged at 23% (95% CI: 0.43–11%) Deaths in the ED remained unchanged Return ED visits within 1 week for all patients remain unchanged	3	1	2
	National: FHR in England	Kelman and Friedman. ²²	Orthopedic surgery waiting times Percentage of ED patients treated <2 h "Mean" ED patient wait time	2003–2006	Retrospective pre-post intervention study	Decrease in orthopedic surgery waiting times from a mean of 4.52 months to 2.31 months Percentage of ED patients treated <2h increased from a mean of 47.4% to 58.3%. "Mean" ED patient wait time reduced from 2.50h to 1.88h.	3	1	2
	National: FHR in England	Locker and Mason. ⁴⁸	Digital preference bias (DPB) in total time in ED reporting in England	April 2004	Quantitative analysis of ED and patient episode data	DPB existed in the total time in ED for episodes with duration between 230 and 249 min for a significant proportion of episodes.	3	0	1

(continued)

Table 2. (continued)

Country	Type of reform	Publication	Performance measure	Time frames	Study design	Result	Quality of study (Newcastle-Ottawa Scale)		
							Selection (0–4)	Comparability (0–2)	Outcome (0–3)
	National: FHR in England	Vezyridis and Timmons, ³⁷	Staff attitudes and experience of providing emergency care following the introduction of the FHR		Qualitative study using semi-structured interviews and thematic analysis	Development of new and sophisticated ways of working by clinicians in the ED to reduce waiting times but with the unintended consequence of pressure on clinicians.	NA	NA	NA
	National: FHR in England	Weber et al. ⁴⁷	Lessons learned from implementing the FHR			Achievement of the 4-h target requires hospital-wide support/ collaborative strategies. Want of organizational ownership can lead to detrimental effects on staff, non-completion of process improvement and risks to care of patients.	NA	NA	NA
	National: ES Targets in England	Dimakou et al. ⁴⁰	Duration analysis of general surgery, trauma and orthopedics, and ophthalmology waiting times in England	2001–2003	Duration analysis of waiting list data	Booked admission patients have the lowest waiting times and waiting list patients the longest. Estimation of survival function identifies considerable variations in waiting times between specialties, operative procedures, and hospitals.	3	1	1
	National: ES Targets in England	Hamilton and Bramley-Harker ⁴⁵	Waiting times for hip fracture surgery in the UK NHS	1989–1995	Retrospective pre- and post-intervention analysis of hospital data.	Post-surgery length of stay reduced from a mean of 22.2 days to 17.5 days' post NHS reforms.	3	1	3

(continued)

Table 2. (continued)

Country	Type of reform	Publication	Performance measure	Time frames	Study design	Result	Quality of study (Newcastle-Ottawa Scale)		
							Selection (0–4)	Comparability (0–2)	Outcome (0–3)
	National: ES Targets in England	Appleby et al. ⁴¹	Maximum waiting time targets on clinical decisions to admit patients from waiting lists for orthopedic surgery in England	1997–2002	Before and after comparative study	Maximum waiting time target increased total trauma and orthopedic admissions from 398,198 in 1997–98 to 428,457 in 2001–02.	3	1	3
	National: ES Targets in England	Propper et al. ¹⁸	Difference-in-difference models of the proportion of people on the elective care waiting list who waited over 6, 9, and 12 months in England and Scotland	1997–2004	Comparative analysis of waiting time data	Using availability status codes, the proportion of people on the elective care waiting list who waited over 6, 9, 12 months was less in England (where targets for maximum waiting times) compared to Scotland (where there was no planned reductions until 2003).	3	1	3
	National: ES Targets in England	Propper et al. ⁴²	Difference-in-difference assessment of the distribution of waiting times of patients on the waiting list for elective care in England and Scotland	1997–2004	Comparative analysis of hospital data	Waiting times for elective care in England reduced by 13 days at the mean and 55 days at the 90 th percentile follow devolution and introduction of centralized targets.	3	1	3

(continued)

Table 2. (continued)

Country	Type of reform	Publication	Performance measure	Time frames	Study design	Result	Quality of study (Newcastle-Ottawa Scale)		
							Selection (0–4)	Comparability (0–2)	Outcome (0–3)
	National: ED and ES Targets in UK	Bevan and Hood; ^{8,9}			Retrospective analysis of pre- and post- intervention hospital data	Reduction in ED and ES waiting times but issues noted with transparency of performance measurement. Suggestions made for introduction of uncertainty on how performance is measured and improved auditing process	NA	NA	NA
	National: ES Targets in England	Cooper et al. ⁴³	Changes in waiting times for elective knee replacement, hip replacement, and cataract repair in the English NHS and statistical relation between waiting times and patient's socioeconomic status	1997–2007	Retrospective study of population-wide patient level data	Mean and median waiting time fell steadily over time from 1997 to 2007 and statistically significant differences between waiting times for each procedure ($P < 0.001$) and intra-year variation in waiting times between deprivation groups for the procedures ($P < 0.05$). However, the relation between deprivation and waiting times became less pronounced over time from 1997 and 2007.	3	1	3
	National: NHS and Community Care Act 1990 in England	Harrison ⁴⁴	Review of significant policies that affected the functioning of the hospital sector		Analysis of utilization of hospital services	Reduction in waiting times for ES services and length of stay for hospital admissions, but hospital resources was put under intense pressure.	NA	NA	NA

(continued)

Table 2. (continued)

Country	Type of reform	Publication	Performance measure	Time frames	Study design	Result	Quality of study (Newcastle-Ottawa Scale)		
							Selection (0–4)	Comparability (0–2)	Outcome (0–3)
	National: NHS reforms on elective procedures in England.	Cookson et al. ⁴⁶	Socioeconomic inequality in the probability of having a procedure canceled after admission	2007	Descriptive and regression analysis of hospital data	After controlling for a range of patient and provider characteristics with statistically significant ($P < 0.001$) increase in the rate of cancelled procedures for each drop in socioeconomic quintiles.	3	0	1

Key: ED = Emergency Department, FHR = 4-h Rule, WA = Western Australia, NEAT = National Emergency Access Target, ES = Elective Surgery, NHS = National Health Service, and UK = United Kingdom.

* There has been some debate about the decrease in mortality as outlined in the Geelhoed and De Klerk study being a result of dilution of the denominator. This discussion is outlined in the following correspondence: <https://www.mja.com.au/journal/2012/196/8/emergency-department-overcrowding-and-mortality-after-introduction-4-hour-rule-170> = ip_login_no_cache%3D633fab0160021c94d8e634ea161ffe9

Improvement in ES Access

All the ES studies included in the synthesis were from the United Kingdom. Similar to the impact of reforms on ED access, targets led to a decrease in waiting times for ES access.^{40–45} Most of the included studies considered selective surgeries to examine patterns of access,^{40–42} but irrespective of the type of surgery, waiting times were reduced. Between 1997 and 2004, waiting times for elective care in England decreased by 13 days at the mean and 55 days at the 90th percentile following devolution and introduction of centralized targets.⁴² While waiting time for elective procedures was reduced, it was also noted that waiting times for different surgeries varied considerably.⁴³ Patient characteristics, such as private or public, outpatient or inpatient, and socioeconomic status, had an impact on access to ES services.^{40,46} However, one study reported that equity, measured as the variation in waiting times per socioeconomic status, improved over time for certain surgeries.⁴³ Similar to the ED studies, considerable pressure on hospital resources and clinicians to reduce ES waiting times and LOS was reported.^{40,44}

Unintended Consequences

Some studies reported that the introduction of targets led to unintended consequences. These included manipulation of performance data (gaming)⁴⁸ and increased pressure on clinicians.^{37,43} The pressure on clinicians, while enabling faster treatment of patients, affected relationships among clinicians and with patients.³⁷ In the case of the 4-h ED program, demand shifted from ED to other parts of the hospital because of the increase in the frequency of admissions from the ED.^{33,39} Within the ED, nursing staff and junior doctors experienced more stress.³⁷ One study identified manipulation of reported ED data (equating to more than 50,000 ED episodes per year).⁴⁸ Another study reported that gaming was practiced by a significant number of institutions in England.⁹ Examples of gaming included weaknesses in arrangements for recording time spent and observed and failure to adequately capture and report quality outcomes for patients.⁹ Some authors have called for better performance governance processes, like systematic audits and open disclosures, to address the issue of reactive gaming.^{8,9}

Some studies identified a rise in medical admissions and an increase in ED representations.^{19,39} However, the authors of the studies commented that the rise in admissions was probably coincidental in the light of increased ED presentations, and the increase in representations was too small to be consequential or reflect poor care.^{19,39} Regarding the pressures on clinicians as a result of the introduction of ED and ES targets and public reporting, evidence of clinical distortion of care was inconclusive or absent.⁴⁷ However, investigative reports into the Mid Staffordshire NHS Foundation Trust identified that the 4-h target

led to occasional distortion of priorities.^{49,50} While the trust board had claimed safety of patients was the top priority, the inquiry identified that the board hadn't adequately supported the implementation of the target through appropriate staffing. In fact, to protect their trust status and achieve a financial surplus, the trust had reduced ED clinical staff, leading to compromised care for ED patients.^{49,50}

Discussion

Governments have used targets as policy instruments to improve health service performance without the need to institute whole-scale reforms.⁶⁻⁸ Use of targets is widespread despite minimal evidence about the effectiveness of targets and reporting on hospital performance.^{8,51,52} This use of targets had been criticized, with some authors labeling targets as terror instruments⁹ and others questioning if they make a difference to patient outcomes.⁵³

Our findings fill in a gap about the impact of health care reforms on hospital performance and provide evidence that time-based targets lead to an improvement in ED and ES access. The findings from this study should be useful to policymakers, hospital managers, and clinicians. While the review covered a specific aspect of health care reform, it still offers significant evidence that ED and ES targets have their role in reform of health services and improvement in access. The findings of this review suggest that targets for ED and ES waiting times may be useful in achieving their aims, and the authors recommend that targets be considered in planning for hospital reforms, specifically measures to improve ED and ES access. However, care must be taken to ensure such targets are accompanied by changes to the system and not met by manipulation of performance data.

While our review identified some issues due to the imposition of these reforms, the review also identified opportunities for better resource use through redesign of spaces and reconfigured timescales of health care work.³⁷ The introduction of targets can also lead to increased collaboration among clinicians and present opportunities for clinical innovation.^{33,37} Examples include use of the 4-h target as a change management tool not only to drive clinical redesign but also foster collaboration.³³ In a few studies, the reforms were observed to facilitate equitable distribution of services among the various economic classes in England.⁴³ These positive outcomes shared a common contributory factor in the form of centralized targets, and these outcomes would most likely not have come about without the introduction of targets.

Targets can be used as motivators and incentives to improve performance. It has been asserted that governance by targets improves access to health services by exerting a form of control over the health care system.⁸ This control is exerted by driving health care providers toward improvement by specifying desired results in advance, monitoring the performance of providers against specified

measures, and establishing a feedback mechanism through measured performance.⁸ Yet, targets have also been identified to enable engagement with clinicians, constructive peer competition, reallocation of resources to priority areas, and increased accountability.⁵⁶⁻⁶⁰ The findings of this study are consistent with previous studies that have identified that public performance reporting stimulates hospitals to improve the quality of care⁵⁴ and targets enable improvement in hospital performance over time.⁵⁵ However, it is recommended that implementation of targets be accompanied by improvements in the system and governance; if not, the advances resulting from the target implementation will be temporary. Some recommendations for system and governance improvement measures include regular audits of data collection and reporting, regular clinical audits, accordance of the highest priority for safety of patients, and adoption of patient centered-care models.^{8, 9, 27,49,50}

The study also identified that introducing targets could result in unintended consequences, such as increased pressure on clinicians and reactive gaming. Hospitals where gaming and pressure on clinicians occurred experienced serious consequences on the safety of patients.^{49, 50} While these are important considerations, findings from the included studies indicated clinicians do not want an environment where no targets exist.^{8, 9} Rather than not introducing targets or withdrawing targets, improvements in the reporting mechanisms and introduction of additional targets, such as outcome-focused targets, are recommended.^{8,53,61} Some authors have advocated for the use of more than time-based hospital performance measures, including quality measures such as readmissions, mortality, and infection rates.^{53, 61} Others have suggested improvement in data collection and reporting, including systematic audits, real-time reporting, and institution of non-public reporting mechanisms.^{8, 33,61,62}

The main limitations of this review were the small number of included studies from only two countries. In addition, the included studies were all observational, pre-post designs, with no control groups, which weakens the strength of the findings. Also, the criteria allowed inclusion of only peer-reviewed primary studies (to ensure quality of the included studies and findings), which limited the number of articles that could be reviewed. However, selection of studies was robust, with two reviewers independently assessing study eligibility and resolving disagreements by consensus, which reduced the risk of selection bias. The quality of the included studies as assessed by the NOS and McMaster criteria were high. Our assumption that meta-analysis would not be possible was confirmed by the disparate nature of the studies, and we were limited to narrative reporting of the results.

While presenting essential findings about ED and ES targets, this study covered only certain aspects of health care reform. The role of targets vis-a-vis other aspects of health care reform and hospital performance (quality, outcomes, finance) and the interplay of targets as incentives or instruments of punishment must be analyzed through further studies. This review identified some

improvements in equity over time for access to elective services, but the finding came from one study. Further studies are required to study the relationship between health care reform and equitable outcomes.

Appendix

Search strategy for Ovid Medline(R) In-Process and Other Non-Indexed Citations and Ovid MEDLINE(R), 1946 to Present

Search conducted 11/6/15

#	Searches	Results
1	Health care reform/	28,733
2	((Health* adj3 reform*) or National Emergency Access Target* or NEAT or National Elective Surgery Target* or NEST or ((4 h or 4 h) adj3 (rule* or target*))).tw.	23,776
3	or/1-2	44,532
4	(Policy making/ or Public policy/ or Policy/ or Health priorities/ or Health planning/ or Health policy/ or Health care sector/ or Government regulation/ or Health care rationing/ or Health plan implementation/ or National health programs/ or Government programs/ or Public sector/ or Federal government/ or Politics/ or Government/ or Financing, Government/ or State medicine/ or Government Agencies/) and reform*.tw.	10,867
5	((National* or federal* or state or government* or public* or sector* or policy* or policies or politic* or socialized or socialised) and reform*).tw.	16,194
6	4 or 5	20637
7	3 or 6	53687
8	Emergency service, Hospital/ or Emergency medical services/ or Emergency medicine/ or Trauma centers/ or Triage/ or Emergencies/	126408
9	((Emergency or trauma) adj2 (accident* or service* or department* or ward* or room* or medicine or treatment* or centre* or center*)) or ED or EDs or ER or ERs or "A&E" or triage or casualty).tw.	210897
10	8 or 9	282419
11	Elective surgical procedures/	8959

(continued)

(continued)

#	Searches	Results
12	((Elective or elected or optional or non-urgent or non-emergency) adj3 (surg* or procedure?)).tw.	19505
13	(Elective or elected or optional or non-urgent or non-emergency).tw. and surgery.fs.	20904
14	or/11-13	36897
15	Hospital Bed Capacity/ or Bed occupancy/ or crowding/ or Ambulance diversion/	7773
16	(Capacity or occupanc* or crowd* or overcrowd* or patient flow* or shortage* or diversion or diverted).tw.	421806
17	"Health services needs and demand"/ or Health services accessibility/	91993
18	(Access* or demand* or availabilit*).tw.	581733
19	Waiting lists/ or time factors/ or Time/ or "Length of stay"/	1104143
20	(Wait* or time or timing or timely or timeliness or "length of stay" or queu* or delay*).tw.	2567306
21	Health care disparities/ or health care costs/ or health expenditures/	50126
22	(Disparit* or equit* or equalit* or inequit* or inequalit* or cost* or burden* or expenditure* or financial* or socioeconomic* or socio-economic* or poverty or underprivilege* or vulnerable).tw.	736453
23	or/15-22	4644114
24	Australasia/ or Australasia*.tw.	3325
25	exp Australia/ or (Australia* or Queensland* or New south wales or victoria* or Tasmania* or northern territory*).tw.	148418
26	New Zealand/ or New Zealand*.tw.	54574
27	exp Canada/ or (Canad* or Alberta* or British Columbia* or Manitoba* or New Brunswick* or Newfoundland* or Labrador* or Northwest Territories or Nova Scotia* or Nunavut* or Ontario* or Prince Edward Island* or Quebec* or Saskatchewan* or Yukon Territory*).tw.	177332
28	Great Britain/ or Channel Islands/ or England/ or Northern Ireland/ or Scotland/ or Wales/ or (Britain* or British or United Kingdom* or England* or Scotland* or Scottish* or Wales or Welsh or Channel Islands or Northern Ireland*).tw.	363927

(continued)

(continued)

#	Searches	Results
29	or/24–28	707207
30	10 or 14	317224
31	7 and 23 and 29 and 30	190
32	Limit 31 to English language	187
33	(Letter or Editorial or Comment).pt.	1415348
34	32 not 33	169
35	Limit 34 to yr= "1994 -Current"	166

Note: / = Medical Subject Heading (MeSH) term search; .tw=search on title and abstract fields; .fs=search on free-floating subheading; .pt=search on publication type field

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Author Biographies

Sandeep Reddy has a background in health service management, public health, and medicine. Following some years in clinical practice and medical education, he attained extensive experience managing various health service projects and formulating policy in Australia, New Zealand, and Europe. For many years, he has focused on teaching and research in health care management and public health. His PhD involved a realist evaluation of emergency department access in the context of national healthcare reforms.

Peter Jones is an emergency medicine specialist and the director of emergency medicine research at Auckland City hospital. He has an MSc in evidence-based health care from Oxford University and an interest in the effect of health policy on quality of care.

Harsha Shanthanna is an associate professor of anesthesia and a chronic pain physician for the Department of Anesthesia, St. Joseph's Healthcare, at McMaster University, Canada. He is also a PhD student at the same university.

Raechel Damarell is a senior librarian, adjunct academic (School of Health Sciences), and investigator with Flinders Filters, a specialist research unit at Flinders University, South Australia. Her research work focuses on finding evidence-based search solutions for improving knowledge translation in areas of health such as cancer, primary health care, integrated care, and Australian Indigenous health.

John Wakerman is the associate dean of Flinders Northern Territory and has a background in public health medicine, remote general practice, remote health services research, and translating evidence into remote and rural health practice.